Space Weather Forecast

Issued on Thursday, 22 September 2022 at 01:16 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Ongoing chance of Moderate flares/R1-R2 Radio Blackout. Minor or Moderate geomagnetic storm intervals expected day 2 (23rd).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate over the past 24 hours. There are four sunspot regions on the solar disc. The largest group on the disc, which is in the southeast quadrant has continued to see the emergence of small spots in its surrounding vicinity, although remains relatively stable. A region closer to the southeast limb was the source of the Moderate flare, however it remains too close to the limb to be able to easily assess its magnetic complexity. A third region is in the southeast disc, to the west of the larger sunspot, but remains small and simple. The only region in the southwest disc has continued to decay as it approaches the southwest limb. No Earth-directed CMEs (coronal mass ejections) were observed in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind has generally persisted at slightly elevated levels, easing from 500 km/s to 450 km/s. Its magnetic field strength remained weak however, with no notable periods with its north-south component pointed in a negative (southward) direction. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was close to background levels, with no solar radiation storms.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Low, with a chance of isolated Moderate flaring, mainly from the sunspot region in the southeast disc.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Slightly elevated solar winds are expected to gradually ease towards background, with the next enhancement expected day 2 (23rd) from a coronal hole fast wind arrival. Generally Quiet geomagnetic activity with isolated Unsettled spells until early day 2. Activity then increasing to Active to G1/Minor Storms, with a chance for G2/Moderate Storm intervals. Conditions then easing to Quiet to Unsettled by day 4 (25th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background levels with no radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	70	30	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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